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UTILITY PATENT APPLICATION TRANSMITTAL (Only for new nonprovisional applications under 37 CFR 1.53(b))	Attorney Docket No.	00766
	First Inventor	Wen-Shi Huang
	Title	MAGNETIZING STRUCTURE...
	Express Mail Label No.	EK832515066US

APPLICATION ELEMENTS See MPEP chapter 600 concerning utility patent application contents.	ADDRESS TO: Assistant Commissioner for Patents Box Patent Application Washington, DC 20231
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<p>1. <input checked="" type="checkbox"/> Fee Transmittal Form (e.g., PTO/SB/17) (Submit an original and a duplicate for fee processing)</p> <p>2. <input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27.</p> <p>3. <input checked="" type="checkbox"/> Specification [Total Pages 9] (preferred arrangement set forth below)</p> <ul style="list-style-type: none">- Descriptive title of the invention- Cross Reference to Related Applications- Statement Regarding Fed sponsored R & D- Reference to sequence listing, a table, or a computer program listing appendix- Background of the Invention- Brief Summary of the Invention- Brief Description of the Drawings (if filed)- Detailed Description- Claim(s)- Abstract of the Disclosure <p>4. <input checked="" type="checkbox"/> Drawing(s) (35 U.S.C. 113) [Total Sheets 5]</p> <p>5. Oath or Declaration [Total Pages 4]</p> <p>a. <input checked="" type="checkbox"/> Newly executed (original or copy) Copy from a prior application (37 CFR 1.63 (d)) (for continuation/divisional with Box 17 completed)</p> <p>b. <input type="checkbox"/> DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).</p> <p>6. <input type="checkbox"/> Application Data Sheet. See 37 CFR 1.76</p>	<p>7. <input type="checkbox"/> CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix)</p> <p>8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)</p> <p>a. <input type="checkbox"/> Computer Readable Form (CRF)</p> <p>b. Specification Sequence Listing on:</p> <p>i. <input type="checkbox"/> CD-ROM or CD-R (2 copies); or</p> <p>ii. <input type="checkbox"/> paper</p> <p>c. <input type="checkbox"/> Statements verifying identity of above copies</p>
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ACCOMPANYING APPLICATION PARTS	
9. <input checked="" type="checkbox"/> Assignment Papers (cover sheet & document(s))	
10. <input type="checkbox"/> 37 CFR 3.73(b) Statement (when there is an assignee)	<input checked="" type="checkbox"/> Power of Attorney
11. <input type="checkbox"/> English Translation Document (if applicable)	
12. <input type="checkbox"/> Information Disclosure Statement (IDS)/PTO-1449	<input type="checkbox"/> Copies of IDS Citations
13. <input type="checkbox"/> Preliminary Amendment	
14. <input checked="" type="checkbox"/> Return Receipt Postcard (MPEP 503) (Should be specifically itemized)	
15. <input checked="" type="checkbox"/> Certified Copy of Priority Document(s) (if foreign priority is claimed)	
16. <input type="checkbox"/> Other:	

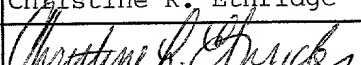
17. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No. _____

Prior application information: Examiner _____ Group / Art Unit. _____

For CONTINUATION OR DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

18. CORRESPONDENCE ADDRESS					
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Signature			Date 10/06/2000

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FEE TRANSMITTAL for FY 2000

Patent fees are subject to annual revision.

TOTAL AMOUNT OF PAYMENT (\$) 808.00

Complete if Known

Application Number
Filing Date
First Named Inventor Wen-Shi Huang
Examiner Name
Group Art Unit
Attorney Docket No. 00766

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Deposit Account Name Kirkpatrick & Lockhart LLP

☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17

☐ Applicant claims small entity status. See 37 CFR 1.27

2. ☒ Payment Enclosed:

☒ Check ☐ Credit card ☐ Money Order ☐ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Code (\$)	Small Entity Code (\$)	Fee Description	Fee Paid
101 690	201 345	Utility filing fee	690.
106 310	206 155	Design filing fee	
107 480	207 240	Plant filing fee	
108 690	208 345	Reissue filing fee	
114 150	214 75	Provisional filing fee	

SUBTOTAL (1) (\$) 690.00

2. EXTRA CLAIM FEES

Total Claims	Extra Claims	Fee from below	Fee Paid
12	-20** = 0	0	0
4	-3** = 1	78.	78.
Multiple Dependent			

**or number previously paid, if greater. For Reissues, see below

Large Entity Code (\$)	Small Entity Code (\$)	Fee Description
103 18	203 9	Claims in excess of 20
102 78	202 39	Independent claims in excess of 3
104 260	204 130	Multiple dependent claim, if not paid
109 78	209 39	** Reissue independent claims over original patent
110 18	210 9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$) 78.00

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Code (\$)	Small Entity Code (\$)	Fee Description	Fee Paid
105 130	205 65	Surcharge - late filing fee or oath	
127 50	227 25	Surcharge - late provisional filing fee or cover sheet	
139 130	139 130	Non-English specification	
147 2,520	147 2,520	For filing a request for ex parte reexamination	
112 920*	112 920*	Requesting publication of SIR prior to Examiner action	
113 1,840*	113 1,840*	Requesting publication of SIR after Examiner action	
115 110	215 55	Extension for reply within first month	
116 380	216 190	Extension for reply within second month	
117 870	217 435	Extension for reply within third month	
118 1,360	218 680	Extension for reply within fourth month	
128 1,850	228 925	Extension for reply within fifth month	
119 300	219 150	Notice of Appeal	
120 300	220 150	Filing a brief in support of an appeal	
121 260	221 130	Request for oral hearing	
138 1,510	138 1,510	Petition to institute a public use proceeding	
140 110	240 55	Petition to revive - unavoidable	
141 1,210	241 605	Petition to revive - unintentional	
142 1,210	242 605	Utility issue fee (or reissue)	
143 430	243 215	Design issue fee	
144 580	244 290	Plant issue fee	
122 130	122 130	Petitions to the Commissioner	
123 50	123 50	Petitions related to provisional applications	
126 240	126 240	Submission of Information Disclosure Stmt	
581 40	581 40	Recording each patent assignment per property (times number of properties)	40.00
146 690	246 345	Filing a submission after final rejection (37 CFR § 1.129(a))	
149 690	249 345	For each additional invention to be examined (37 CFR § 1.129(b))	
179 690	279 345	Request for Continued Examination (RCE)	
169 900	169 900	Request for expedited examination of a design application	

Other fee (specify) _____

* Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$) 40.00

SUBMITTED BY

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Signature	<i>Christine R. Ethridge</i>	Date	10 October 2000		

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MAGNETIZING STRUCTURE OF MOTOR

FIELD OF THE INVENTION

The present invention relates to a magnetizing structure of a motor,
5 and more particularly to a structure for magnetizing a rotor magnet or a
stator magnet of a direct current motor.

BACKGROUND OF THE INVENTION

A traditional direct current motor essentially comprises two major
components: a rotor and a stator, one of which is made of permanent
10 magnet and the other is an electric magnet, and the one is disposed
circumferentially by the other. Between a rotor and a stator, there exists
an air gap. In one case, an inner rotor rotates within a stator; in another
case, an outer rotor rotates around an inner stator. A permanent magnet
incorporated on either a rotor or a stator directs a magnetic field into the
15 air gap, which interacts with another magnetic field of changing polarity
to develop the torque for driving a motor.

Fig. 1 shows a magnetizing structure that is commonly found in a
motor. Such structure of an outer-rotor type motor includes a rotor 12
having a magnet cylinder 121 with smooth surfaces on both sides and a
20 stator 11 having a plurality of silicon steel sheets 111 wound by a
plurality of winding coils 13. When a current is applied to a winding
coil, an electric magnetic field is created to repulse the magnetic field
caused from the permanent magnet, thereby the rotor rotates and drives
an article such as a fan.

25 The permanent magnet is usually in a shape of cylinder; therefore,
the term "magnet cylinder" hereinafter means a cylindrical-shaped
magnet, unless otherwise specified.

15 Therefore, the present invention provides an improved magnetizing
structure for overcoming the problems described above.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a structure for magnetizing a rotor magnet of a motor, which includes a rotor having a magnet cylinder with a wavy curve surface and a stator having a plurality of silicon steel sheets wound by a plurality of winding coils.

Preferably, the wavy curve surface of the magnet cylinder is one of an inner wavy curve surface and an outer wavy curve surface.

Preferably, the wavy curve surface of the magnet cylinder includes a
25 plurality of curve surfaces having different arc centers.

The plurality of silicon steel sheets can be symmetric or asymmetric; preferably, they are symmetrical.

drawings, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a sectional view showing a magnetizing structure of motor according to prior art;

- 5 Fig. 2 is a sectional view showing a structure for magnetizing of a rotor having a magnet cylinder with an inner wavy curve according to the first preferred embodiment of the present invention;

- Fig. 3 is a sectional view showing a structure for magnetizing a rotor having a magnet cylinder with an outer wavy curve according to the first preferred embodiment of the present invention;

10 Fig. 4 is a sectional view showing a structure for magnetizing a stator having a magnet cylinder with an outer wavy curve according to the second preferred embodiment of the present invention; and

- Fig. 5 is a perspective view showing a structure for magnetizing a rotor having a magnet cylinder with a lumpy edge according to the third preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

- Referring to Fig. 2, the first preferred embodiment of the present invention provides a structure for magnetizing a rotor magnet, which includes a rotor having a magnet cylinder 22 with an inner wavy curve surface 25 and a stator 21 having a plurality of silicon steel sheets 24 wound by a plurality of winding coils 23. The silicon steel sheets 24 are symmetrical, which facilitates mass production to reduce cost. Since the magnet cylinder 22 is manufactured by a molding and sintering process, the shape or size of it can be predetermined and the cost is not high. Owing to the inner wavy curve surface 25, the magnet cylinder 22 directs a magnetic field into the air gap for interacting with the

inductive magnetic field easily to develop the torque and radiate the internally generated heat.

The structure for magnetizing a rotor magnet shown in Fig. 3 is the same as that in Fig. 2, except that a rotor having a magnet cylinder 22
5 with an outer wavy curve surface 39.

Referring to Fig. 4, the second preferred embodiment of the present invention provides a structure for magnetizing a stator magnet, which includes a stator having a magnet cylinder 40 with an outer wavy curve surface 45 and a stator 41 having a plurality of silicon steel sheets 42
10 wound by a plurality of winding coils 43. Certainly, the outer wavy curve surface can be replaced with an inner wavy curve surface.

Referring to Fig. 5, the third preferred embodiment of the present invention provides a structure for magnetizing a rotor magnet. The structure in Fig. 5 is the same as that in Fig. 2, except that the rotor has a
15 magnet cylinder with a lumpy edge which is a combination of a plurality of concave surface 52 and a plurality of convex surfaces 51. Certainly, a structure for magnetizing a stator magnet is also suitable, wherein the stator has a magnet cylinder with a lumpy edge which is a combination of a plurality of concave surfaces and a plurality of convex surfaces.

20 As will be apparent from the above description according to the present invention, the improved magnetized structure for magnetizing a rotor magnet or a stator magnet of a direct current motor is suitable to start a motor easily, radiate the internally generated heat quickly and prevent the locked rotor condition.

25 While the invention has been described in terms of what are presently considered to be the most practical and preferred embodiments, it is to be understood that the invention needs not be limited to the

disclosed embodiment. On the contrary, it is intended to cover various modifications and similar arrangements included within the spirit and scope of the appended claims which are to be accorded with the broadest interpretation so as to encompass all such modifications and similar structure.

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WHAT IS CLAIMED IS:

1. A structure for magnetizing a rotor magnet of a motor, comprising :
a rotor having a magnet cylinder with a wavy curve surface; and
a stator having a plurality of silicon steel sheets wound by a plurality
5 of winding coils.
2. A structure of Claim 1, wherein said wavy curve surface of the
magnet cylinder is one of an inner wavy curve surface and an outer
wavy curve surface.
3. A structure of Claim 2, wherein said wavy curve surface of said
10 magnet cylinder includes a plurality of curve surfaces having different
arc centers.
4. A structure of Claim 1, wherein said plurality of silicon steel sheets is
symmetrical.
5. A structure for magnetizing a stator magnet of a motor, comprising :
15 a stator having a magnet cylinder with a wavy curve surface; and
a rotor having a plurality of silicon steel sheets wound by a plurality of
winding coils.
6. A structure of Claim 5, wherein said wavy curve surface of said
magnet cylinder is one of an inner wavy curve surface and an outer
20 wavy curve surface.
7. A structure of Claim 6, wherein said wavy curve surface of said
magnet cylinder includes a plurality of curve surfaces having different
arc centers.
8. A structure of Claim 5, wherein said plurality of silicon steel sheets is
25 symmetrical.
9. A structure for magnetizing a rotor magnet, comprising : a rotor
having a magnet cylinder with a lumpy edge; and

a stator having a plurality of silicon steel sheets wound by a plurality of winding coils.

10. A structure of Claim 9, wherein the structure of said lumpy edge is a combination of a plurality of concave surfaces and a plurality of convex surfaces.
11. A structure for magnetizing a stator magnet, which includes a stator having a magnet cylinder with a lumpy edge and a rotor having a plurality of silicon steel sheets wound by a plurality of winding coils.
12. A structure of Claim 11, wherein the structure of said lumpy edge is a combination of a plurality of concave surfaces and a plurality of convex surfaces.

MAGNETIZING STRUCTURE OF MOTOR

ABSTRACT OF THE DISCLOSURE

The present invention provides a structure for magnetizing a rotor
5 magnet of a motor, which includes a rotor having a magnet cylinder with
a wavy curve surface and a stator having a plurality of silicon steel
sheets wound by a plurality of winding coils. The present invention
also provides a structure for magnetizing a stator magnet of a motor,
which includes a stator having a magnet cylinder with a wavy curve
10 surface and a rotor having a plurality of silicon steel sheets wound by a
plurality of winding coils.

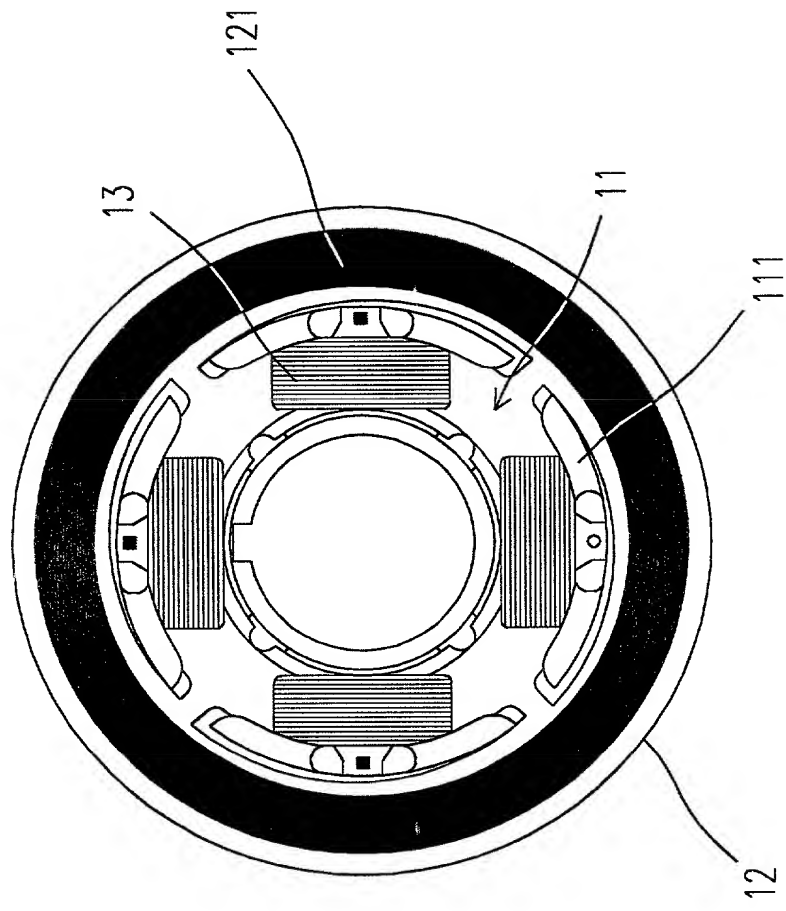


Fig. 1(PRIOR ART)

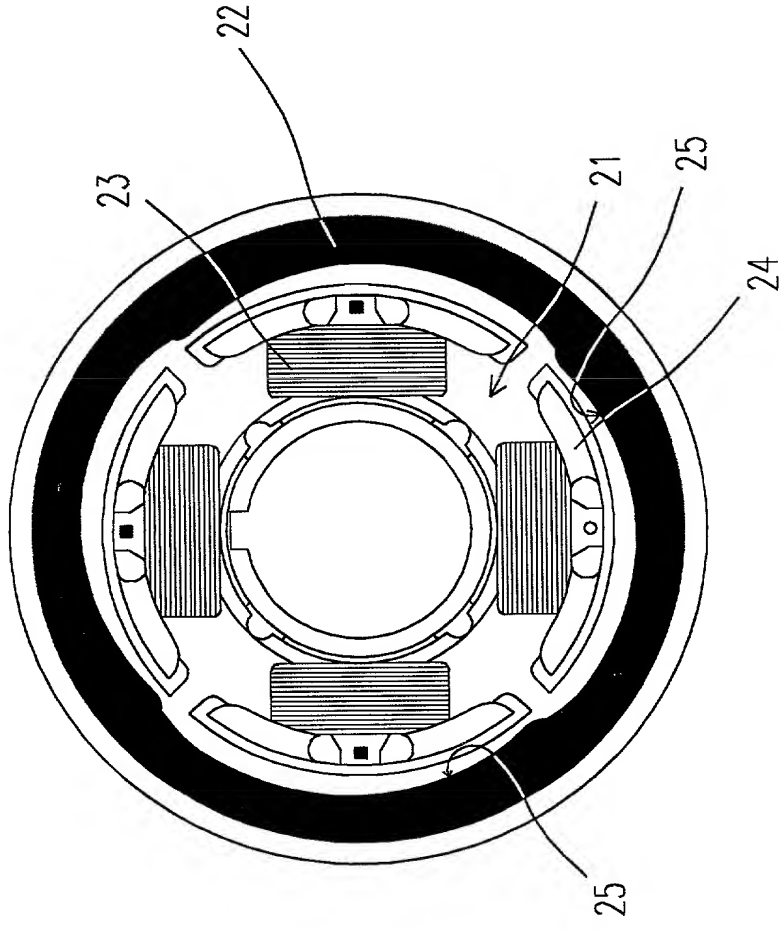


Fig. 2

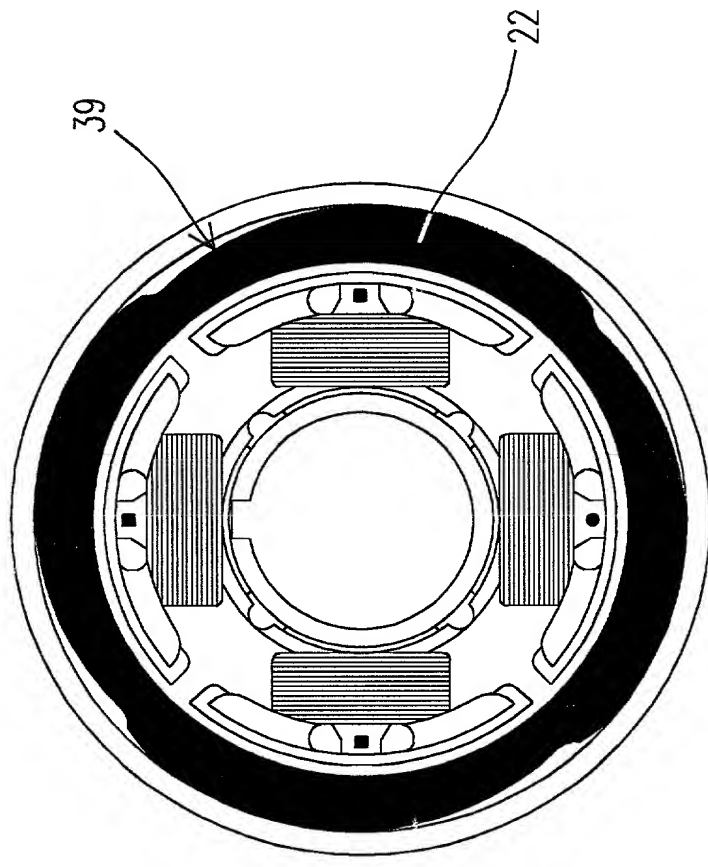


Fig. 3

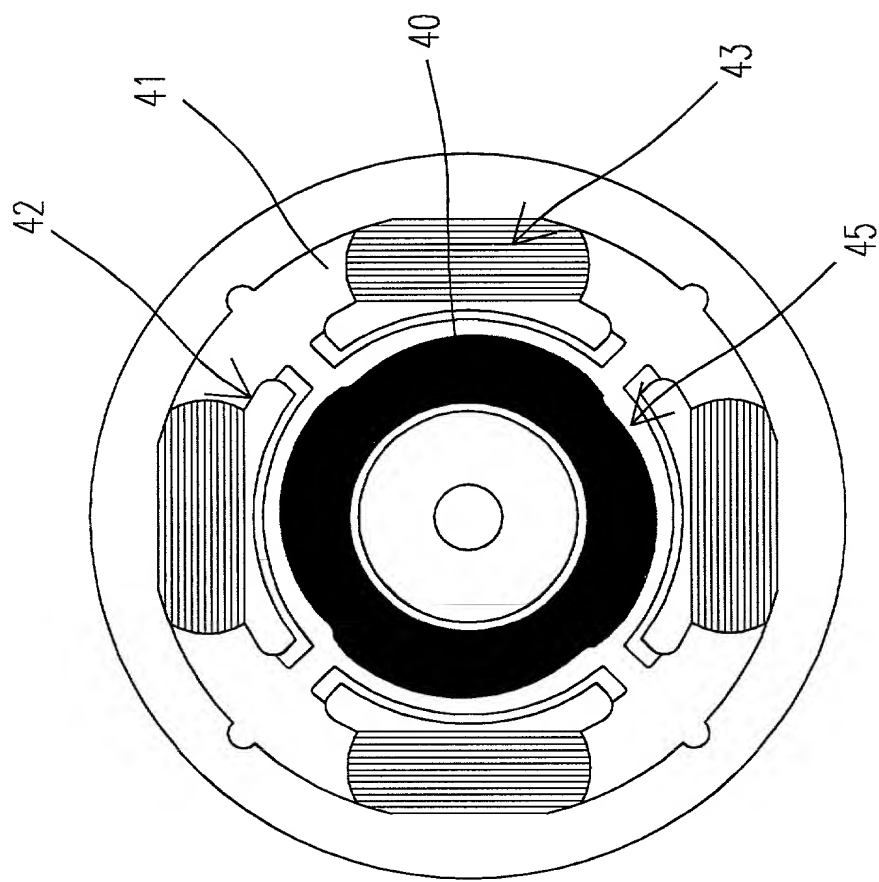


Fig. 4

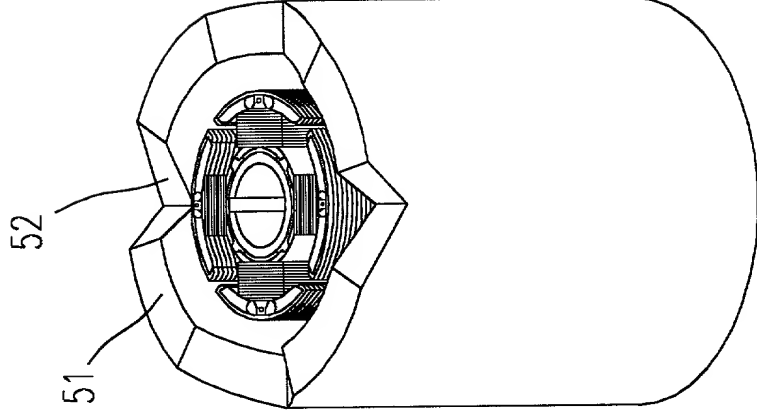


Fig. 5

Patent and Trademark Office-U.S. DEPARTMENT OF COMMERCE

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)
(patented, pending, abandoned)

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POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

See Attachment

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Inventor's signature <i>Wen-Shi Huang</i>	Date Sep. 13, 2000
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Full name of second joint inventor, if any Lin Kuo-Cheng	
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00000140E58950

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